

number of angles PSQ , QSQ be also taken, each equal to MSP , the angle which the first drawn radius makes with the axis, then will the continued product of all the radii SP be equal to the last SQ multiplied by the latus rectum raised to the power of $n - 1$, n being the number of angles taken.

The author thence proceeds to deduce other theorems that would be for the most part complicated and unintelligible when geometrically enunciated, though sufficiently simple in their algebraic expressions. They are indeed, as the author observes, properties rather of the equations of the conic sections, than of the curves themselves; properties of a limited number of disjointed points, determined according to a certain law, rather than of a series of consecutive points composing a line.

In the course of this investigation the author employs one species of notation, which is new, and for which he apologizes, by explaining its advantage in point of simplicity.

Observation of the Summer Solstice, 1812, at the Royal Observatory.
By John Pond, Esq. *Astronomer Royal, F.R.S.* Read November 12, 1812. [*Phil. Trans.* 1813, p. 27.]

Since a minute description of the new circular instrument, which has been lately put up at Greenwich, is intended to be given to the Society as soon as it is completed in every respect, the Astronomer Royal takes no further notice of its construction than is necessary to show by what means the results of his observations of the sun at the last solstice was obtained.

In other instruments, which take their point of departure from a plumb-line or level, the zenith distance of the sun is the primary object of investigation; and the polar distance of the sun, which is the ultimate object, is obtained by adding the co-latitude of the place, which completes the entire arc.

But by the mural circle at Greenwich, to which there is neither level nor plumb-line, the total arc may be measured without any exact knowledge of the zenith point; and the co-latitude, which in all other cases it is so essential to know correctly, becomes an object of mere curiosity, rather than of real necessity.

It is, however, convenient to assume some imaginary point near the zenith, the position of which, with respect to the fixed stars, may be determined within one tenth of a second; and from this imaginary point Mr. Pond measures the distances of the sun southward, and of the pole northward, as the best means of obtaining the entire arc; but he also adds a computation of the same solstitial place of the sun, as obtained by direct measurement from the pole without the aid of his imaginary intermediate point, and the difference is found to be only 0.15 of a second.

In the determination of this arc, it is evident that, however accurately it may have been mechanically determined, it must still be

subject to whatever uncertainty remains with regard to astronomical refraction.

As the Astronomer Royal has not been in possession of the instrument a sufficient length of time for deducing the real quantity of refraction from his own observations, he has hitherto employed those of Dr. Bradley, which have been many years in use at the Royal Observatory; but he observes, that any alteration which may be hereafter found necessary, may easily be made as correction to the above observations.

Observations relative to the near and distant Sight of different Persons.

By James Ware, Esq. F.R.S. Read November 19, 1812. [*Phil. Trans.* 1813, p. 31.]

The author states, in the first place, that he has rarely observed short-sightedness in children under ten years of age, and that he considers it as commencing generally between that period and eighteen; that it at first occasions so little inconvenience, that it is not noticed by those who have not access to concave glasses, and consequently is very frequently overcome by the natural efforts of the eye. Persons, on the contrary, in the higher ranks of society, who have it more in their power to indulge a slight weakness, by having recourse to short-sighted glasses, soon confirm the imperfection, and in many instances even render it worse, by employing glasses deeper than are necessary.

For the purpose of instituting a comparison between the proportional prevalence of this defect in different classes of society, Mr. Ware made inquiry in the three regiments of Foot Guards, containing nearly 10,000 men, and also in the two Universities, Oxford and Cambridge. In the Guards short-sightedness among the privates is scarcely known; and not more than half a dozen recruits are said to have been rejected for this imperfection in the course of twenty years. In the Universities, on the contrary, the numbers are so considerable, that in one of the colleges in Oxford, it is said that of 127 persons, so many as thirty-two have used either a hand-glass or spectacles. It is thus proved that short-sightedness is corrected in one class of persons, and encouraged in the other; and it is evident that even in those who absolutely require glasses, it may be increased by using such as are deeper than are really necessary, or counteracted by employing the lowest with which the eye can see with comfort.

It is observed, however, that extreme short-sightedness sometimes occurs in children from visible imperfection in the form of the cornea, and sometimes arises as an accidental and temporary consequence of general debility, and is then removable by chalybeate medicines and bracing applications.

Dr. Porterfield has observed, that the pupils of short-sighted persons are in general more dilated than those of others; but Mr. Ware does not admit this to be generally the case; neither does he admit